

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HU-JUNG WU and JAMES S. DRAGE

Appeal No. 2003-1366
Application No. 09/488,075

ON BRIEF

Before PAK, KRATZ and MOORE, Administrative Patent Judges.
KRATZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-19, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to a method for treating a silanol-containing silica film located on a substrate with an oligomer or polymer reactive with the silanols of the film to form a hydrophobic coating on the film. According to appellants (specification, page 4), their inventive surface modification method results in a treated film with enhanced mechanical strength while achieving desirable dielectric values. Also, see page 34, Table 7 and numbered lines 9-13 of the specification. A further understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced below.

1. A process for treating a silica film on a substrate, which comprises reacting a suitable silica film with a composition comprising a surface modification agent, wherein said silica film is present on a substrate and wherein said reaction is conducted under conditions and for a period of time sufficient for said surface modification agent to form a hydrophobic coating on said film and said surface modification agent comprises at least one type of oligomer or polymer reactive with silanols on said silica film.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Shimizu et al. (Shimizu)	5,013,585	May 07, 1991
Gnade et al. (Gnade)	5,470,802	Nov. 28, 1995

Varanasi et al. (Varanasi)	5,798,144	Aug. 25, 1998
Masakara et al. (Masakara)	6,037,277	Mar. 14, 2000

Smirnov et al. (Kotelnikov¹), Russian Pat. Appl. No. 2,089,499, published September 10, 1997.

Claims 1-7, 9, 10, 15, 16, 18 and 19 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Masakara and Gnade in view of Kotelnikov. Claims 8, 11-14 and 17 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Masakara and Gnade in view of Kotelnikov, Varanasi and Shimizu.

We refer to the brief and reply brief and to the answers for a complete exposition of the opposing viewpoints expressed by appellants and the examiner concerning the issues before us on this appeal.

OPINION

Upon careful review of the respective positions advanced by appellants and the examiner with respect to the rejections that are before us for review, we find ourselves in agreement with appellants' viewpoint in that the examiner has failed to carry

¹ The examiner and appellants refer to this reference as Kotelnikov et al. Also, our references to Kotelnikov in this decision is to the English language translation of the published Russian patent application. The record reflects that a copy of the translation was submitted to appellants with the examiner's answer.

the burden of establishing a prima facie case of obviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); In re Piasecki, 745 F.2d 1468, 1471-1472, 223 USPQ 785, 787-788 (Fed. Cir. 1984). Accordingly, we will not sustain the examiner's rejections.

Masakara and Gnade are generally directed to the manufacture of highly porous dielectric films on semiconductor substrates. Both Masakara and Gnade disclose the optional use of surface modifiers, such as trimethylchlorosilane (TMCS), to help impart desirable properties, such as hydrophobicity, to the film.

The examiner has determined that "Masakara and Gnade fail to disclose that the surface modification agent is an oligomer or polymer reactive with silinols (sic) on the silica film" (answer, page 3), a feature required by all of appellants' claims. In order to make up for that acknowledged deficiency in the teachings of Masakara or Gnade relative to the here claimed subject matter, the examiner turns to Kotelnikov. In this regard, the examiner (answer, page 3) asserts that:

Kotelnikov et al. disclose a method of producing hydrophobic silica coatings by chemical modification reactions with oligomer or polymer silicon-containing compounds.

Therefore, given the substantial teachings of Masakara et al. and Gnade et al. in view of Kotelnikov et al., it would have been obvious to one with ordinary

skill in the art at the time of the invention to use a surface modification agent, which is an oligomer or polymer reactive with silinols (sic) on the silica film.

In the supplemental answer, a further summary of what the examiner regards Kotelnikov to teach regarding the use of an oligomeric or polymeric modification agent is provided. However, the examiner has not identified a particularized suggestion, reason or motivation to combine the applied references.

As pointed out by appellants in the briefs (see, e.g., page 8, first two paragraphs of the brief), the examiner has not identified a reasonable incentive for the proposed modification of either of the primary references based on the applied references' teachings. In this regard, the primary references are concerned with dielectrics including silanol containing silica coatings for semiconductor substrates and the constellation of properties associated therewith and Kotelnikov (pages 2 and 3) is concerned with hydrophobic dispersed substances useful in the oil and gas industry for changing the oil and water permeability of strata. While Kotelnikov is directed to improving hydrophobicity properties of dispersed silica substances for use in the oil and gas industry via surface modification using oligomer or polymer silicon-containing

compounds (for example, polymethylsilazanes) as a possible fourth component in their method (Kotelnikov, page 8), the examiner has not established that the surface modification oligomer or polymer silicon-containing agents disclosed by Kotelnikov would be useful in the disparate semiconductor manufacturing methods of the primary references while not adversely affecting the properties of the semiconductors. The examiner's effort falls short in failing to establish a particularized suggestion for the proposed modification of the specific primary references' semiconductor fabrication methods in a manner that would have led one of ordinary skill in the art to arrive at the claimed invention with a reasonable expectation of success in so doing. See In re Rouffet, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998). The examiner has not shown how the other references applied by the examiner in rejecting claims 8, 11-14 and 17 remedy the above-noted shortcomings. It follows that we will not sustain either of the examiner's rejections.

CONCLUSION

The decision of the examiner to reject claims 1-7, 9, 10, 15, 16, 18 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Masakara and Gnade in view of Kotelnikov and to reject claims 8, 11-14 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Masakara and Gnade in view of Kotelnikov, Varanasi and Shimizu is reversed.

REVERSED

CHUNG K. PAK)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
PETER F. KRATZ)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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JAMES T. MOORE)	
Administrative Patent Judge)	

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RICHARD S. ROBERTS
P.O. BOX 484
PRINCETON, NJ 08542